



## JPSS Joint Polar Satellite System

*A collaborative mission between NOAA and NASA*

[www.jpss.noaa.gov](http://www.jpss.noaa.gov)



Harry Cikanek  
Director

### From Harry

I am pleased to report that the JPSS program has marked numerous achievements this quarter. The JPSS-1 mission continues to progress toward launch readiness with the successful completion of JPSS-1's Mission System Integration Review and the integration of four out of five instruments onto the spacecraft. I would also like to congratulate JPSS team members Wanda Harding and Thomas Wrublewski, who were recognized by the Under Secretary of Commerce for Oceans and Atmosphere for their achievements and excellence. I look forward to continued program success in 2015. To learn more about past JPSS news and achievements, you can read previous issues of the JPSS Newsletter [here](#).

## Three JPSS-1 Instruments Integrated with the Spacecraft

The Ozone Mapping and Profiler Suite-Nadir (OMPS-N), Visible Infrared Imaging Radiometer Suite (VIIRS), and Cross-track Infrared Sounder (CrIS) instruments are now all integrated with the JPSS-1 spacecraft. Each instrument was integrated at Ball Aerospace & Technologies Corporation in Boulder, Colorado. JPSS-1 is the next polar-orbiting NOAA satellite in the JPSS constellation and is scheduled for launch in 2017.

"The integration of these three instruments, in addition to CERES (Clouds and Earth's Radiant Energy System) which has been previously integrated, marks our continued progress toward our on schedule launch of JPSS-1 satellite," said Harry Cikanek, JPSS program director. "JPSS satellites represent significant technological and scientific advances for weather, climate, environmental and oceanographic forecasting and monitoring."

The VIIRS instrument, built by the Raytheon Company in

El Segundo, California, collects visible and infrared imagery and global observations of land, atmosphere, cryosphere and oceans. VIIRS data is used to generate many critical environmental products for monitoring snow, sea ice, hurricanes, clouds, fog, aerosols, fire, volcanic ash, smoke plumes, dust, vegetation health, phytoplankton abundance and chlorophyll. VIIRS data aids in forecasting products of sea ice and ocean nutrients, which help maritime and commercial fishing industries—further improving vessel routing and making fishery management more efficient. VIIRS also benefits the agricultural industry through fire monitoring and vegetation index—along with weather warnings—which are critical to production yield.

OMPS-N was built by Ball Aerospace & Technologies Corporation. OMPS-N tracks the health of the stratospheric ozone layer and measures the concentration of ozone in the Earth's atmosphere, which will be used to generate total column ozone measurements. Data from OMPS-N will continue three decades of total ozone and ozone profile records and be used by ozone-assessment researchers and policy makers to create global climate models.

Built by Exelis in Fort Wayne, Indiana, CrIS provides more



... JPSS satellite data contributes to a suite of products, including active fire detection, sea surface temperature, sea ice concentration and green vegetation fraction, which support operational applications for the aviation industry, weather forecasting, transportation sectors, commercial fishing, agriculture forecasting and emergency response.

accurate, detailed atmospheric temperature and moisture observations essential for weather forecasting. CrIS does this with the high performance needed to maintain and improve weather forecasts up to five to seven days in advance of a severe weather event. The sounding accuracy CrIS provides advances the overall capabilities of NOAA's operational sounders.

JPSS delivers key observations for the Nation's essential



(Top): Ball and Raytheon technicians integrate the VIIRS Optical and Electrical Modules onto the JPSS-1 spacecraft. (Middle): Ball Aerospace technicians lower the OMPS-N main electronics box onto the JPSS spacecraft. (Bottom): Ball Aerospace technicians prepare the CrIS instrument for integration. Credit: Ball Aerospace & Technologies Corp

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products and services, including forecasting severe weather events like hurricanes, tornadoes and blizzards days in advance and assessing environmental hazards such as droughts, forest fires, poor air quality and harmful coastal waters, helping to secure a more "Weather-Ready Nation."

JPSS enables scientists and forecasters to monitor and predict weather patterns with greater accuracy and to study long-term climate trends by extending the more than 30-year satellite data record. JPSS is a collaboration between NOAA and NASA. NOAA is responsible for managing and operating the JPSS program, while NASA is responsible for developing and building the JPSS instruments, spacecraft, launch services and major components of the ground segment. To learn more about JPSS-1 instruments, please click [here](#).

## JPSS Staff Receive the 2015 Bronze Medal and Distinguished Career Award

On February 3, 2015, JPSS team members Wanda Harding and Thomas Wrublewski were awarded the Department of Commerce Bronze Medal and the NOAA Distinguished Career Award, respectively. Since 1949, the Bronze Medal Award has been the highest honor award granted by the Under Secretary of Commerce for Oceans and Atmosphere, recognizes superior performance by federal employees. NOAA's Distinguished Career Award honors cumulative career achievement of sustained excellence, as well as recognizing significant accomplishments across all NOAA program areas and functions that have resulted in long-term benefits to NOAA's mission and strategic goals.



Left: Dr. Kathryn Sullivan, NOAA Administrator (left) and Cherish Johnson, NESDIS CFO (right) award the Distinguished Career Award to Thomas Wrublewski, NOAA Physical Scientist (center).



Bottom left: Wanda Harding, JPSS Technical Director displays her Bronze Medal Award.



# Successful Completion of JPSS-1 Mission System Integration Review

JPSS successfully completed the JPSS-1 Mission System Integration Review (MSIR) demonstrating the expected maturity for Key Decision Point D (KDP-D) is on plan and ready to progress with assembly, integration and test with acceptable risk. The next major KDP for the JPSS-1 mission will be KDP-E, which indicates readiness for launch and early operations.

## Preserving Our Coral Reefs:

### How NOAA's Polar-orbiting Satellite Data are Used to Help Reef Conservation Around the World

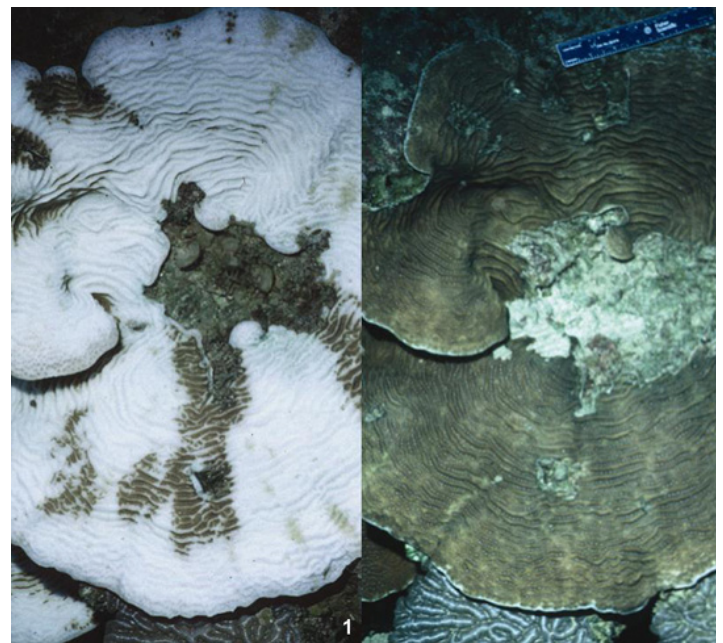
The NOAA/NASA Suomi NPP satellite's VIIRS instrument helps improve NOAA's ability to track coral reef health. The National Environmental Satellite Data Information Service's (NESDIS) Coral Reef Watch (CRW) effort, with support from the NOAA Coral Reef Conservation Program, produces information to help protect coral reefs. CRW uses remote sensing and in-situ tools for near-real-time and long-term monitoring, modeling and reporting of physical environmental conditions of coral reef ecosystems.

CRW uses a blend of polar-orbiting satellite data from NOAA Polar-orbiting Operational Environmental Satellites (POES), Suomi NPP's VIIRS and NOAA Geostationary Operational Environmental Satellites (GOES) for Sea Surface Temperature (SST) analysis. This provides a 100-fold improvement in spatial resolution over earlier products, giving scientists crucial information to track reef health around the globe. For the past 15 years, CRW has provided coral reef managers, scientists and the public with

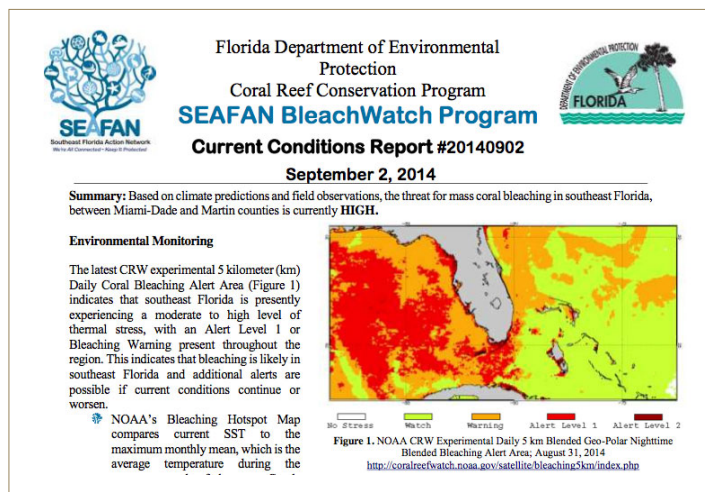
satellite-based products, maps and alerts when high SST are present, a key cause of coral bleaching. CRW recently released its "Coral Bleaching Thermal Stress Outlook" which forecasts the potential for coral bleaching up to four months in the future.

The new products were made available to users in the summer of 2014, just in time to document record-breaking coral bleaching in areas within the waters of the Hawaiian Islands, Commonwealth of the Northern Mariana Islands, Guam and Florida and were immediately picked up and used by regional resource management agencies.

These new blended SST products help reduce missing data caused by cloud coverage over the oceans. This is particularly vital in areas such as the "Coral Triangle," which consists of the tropical marine waters of Indonesia, Malaysia, Papua New Guinea, Philippines, Solomon Islands and Timor-Leste, that had six months of persistent cloud cover in 2010. The VIIRS instrument provides data for the ocean, land, aerosol and cloud research and offers improved spatial resolution, which is a substantial improvement for coastal and estuarine areas in particular. Read the full story [here](#).



An *Agaricia* coral colony shown: 1) bleached, and 2) almost fully recovered from a bleaching event. Photos credit: Andy Bruckner, NOAA's National Marine Fisheries Service



A Coral Reef Conservation Program Warning Report utilizing VIIRS data, from September 2014, sent to regional resource management agencies. Credit: Coral Reef Watch

## CrIS Transitions to Full Spectrum Configuration

The CrIS Instrument, on-board the NOAA/NASA Suomi NPP satellite, was successfully transitioned to full spectrum configuration in December. CrIS will operate in full spectrum configuration for the remainder of the Suomi NPP mission as well as future JPSS missions. CrIS provides accurate, detailed atmospheric temperature and moisture

observations for weather and climate applications. Now, CrIS can observe higher altitude water vapor and carbon monoxide (CO) measurements not previously possible, providing a continuity of data established by the NASA Earth Observing Satellites (EOS) program.

“The use of the Atmospheric InfraRed Sounder (AIRS) for monitoring the global transport of carbon monoxide can now be accomplished by CrIS,” said Mitch Goldberg, Ph.D., JPSS Program Scientist. “This was an important goal of the user community since 2009, since CO from forest fires and significant anthropogenic sources are a major air quality issue.”

CrIS previously provided a total of 1305 channels for sounding the atmosphere and now, in full spectrum mode, provides 2211 channels. This increase in channels

will enable further improvements to weather forecasts. Daily CrIS measurements are used by NOAA’s National Weather Service to enhance numerical weather prediction model forecasts, aiding in both short and long-term weather forecasting. Over longer timescales, they will help improve understanding of climate phenomena, such as El Niño and La Niña.

The Center for Satellite Applications and Research (STAR), the science arm of NESDIS, will generate new sensor data records from the additional CrIS spectral data, which will be archived as well as made available to the community through the file transfer protocol. These records will allow the user community to prepare to ingest the sensor data stream into their algorithm development for weather forecasting models in 2016.

## Events and Conferences

### 2015 American Meteorological Society Annual Meeting

JPSS team members spoke and participated in many sessions, providing an explanation of the societal benefits of satellite data applications, satellite test beds and proving ground advances, algorithm development, and user readiness plans.

JPSS Program Director Harry Cikanek spoke at “Program Overviews and Status for New Operational Environmental Satellite Systems.” This session highlighted development progress, instrument integration, user readiness efforts and launch plans. This session was moderated by JPSS Program Scientist Mitch Goldberg.



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JPSS Program Deputy Director Ajay Mehta, gave a presentation at “Societal Benefits of Satellite Data Applications,” discussing the societal and economic contributions of JPSS. In addition, the methodology of the recent JPSS economic benefit study was highlighted.

See the additional presentations by JPSS team members and learn more about the AMS annual meeting by visiting [www.ametsoc.org](http://www.ametsoc.org), and view additional photos from AMS [here](#).

### 2015 NOAA Satellite Science Week

The 2015 NOAA Satellite Science Week occurred in Boulder, Colorado, from February 23–27, 2015, and served as a joint meeting to review and discuss the state of the science portfolio of NOAA’s most critical satellite programs, JPSS and GOES-R. Over 130 participants from NOAA’s science and operational communities and from stateside and overseas locations attended as well as some international partners.

Attendees received information on JPSS and GOES-R satellite products, their state of development and maturity, how these products are used operationally, the risk reduction initiatives to identify new products and operational applications, and the satellite calibration and validation programs. Poster sessions allowed for critical one-on-one discussions that are vital to the transition of scientific ideas to operational use. The meeting successfully met its ambitious objectives to promote the understanding of the technical foundation of the satellite programs and how to leverage these capabilities to maximize their value to the NOAA operational mission.

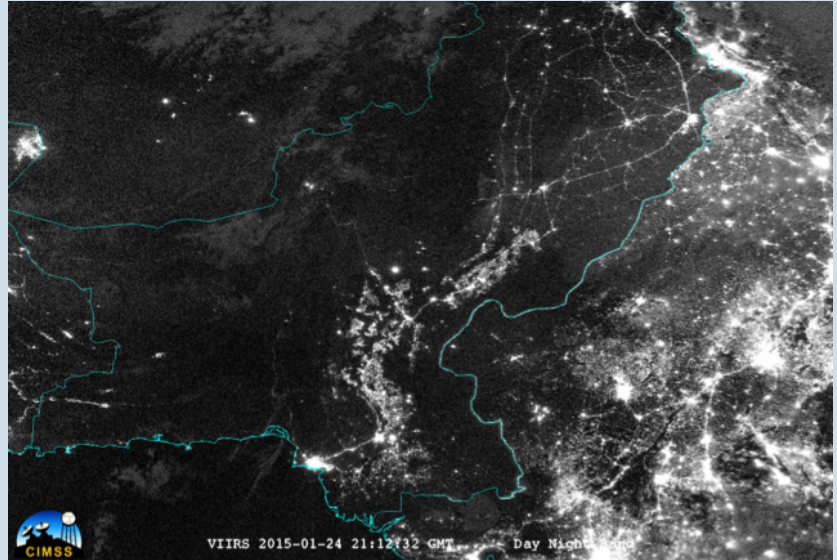
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## Interesting Images

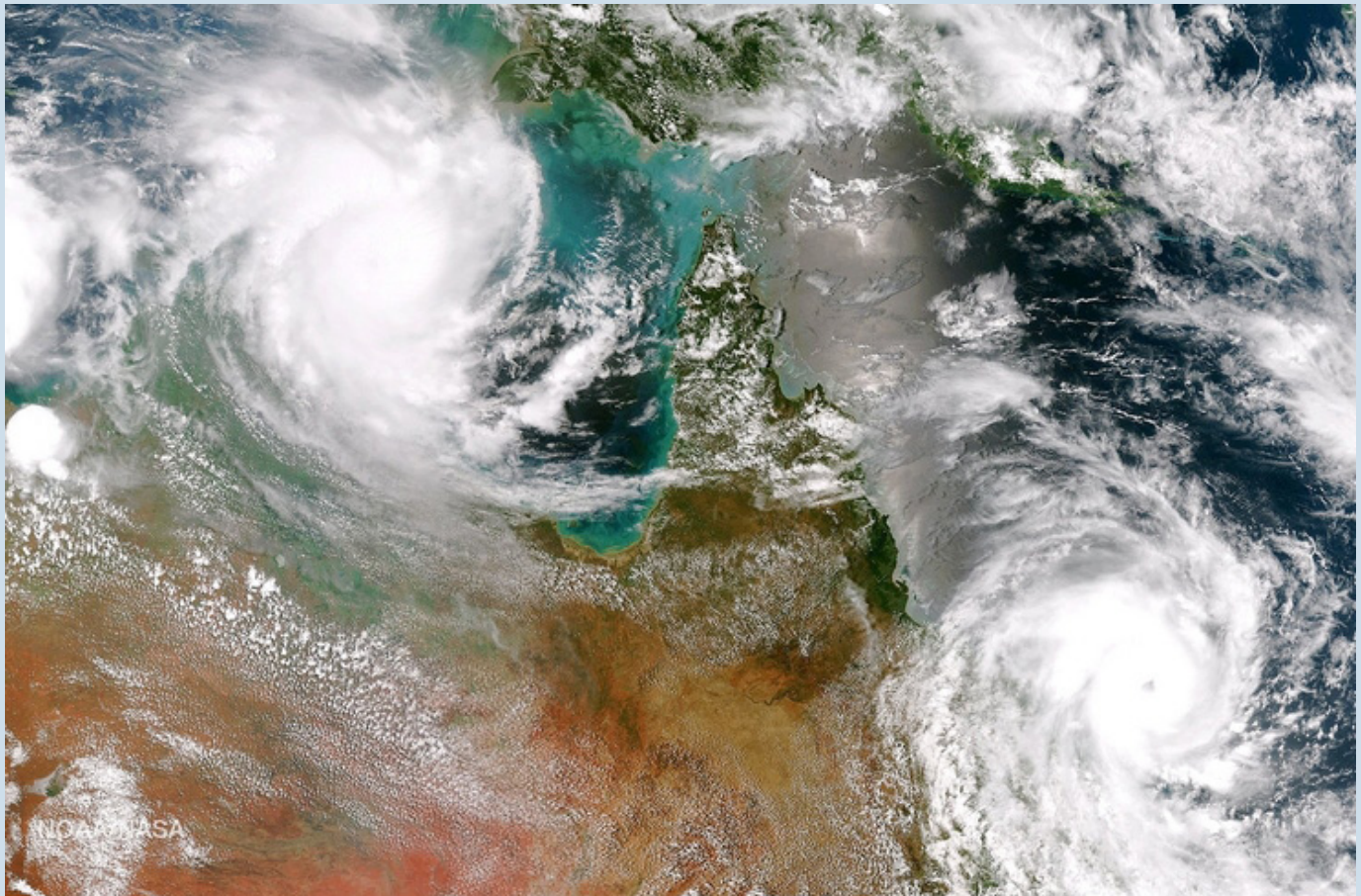
### Pakistan Power Outage

On January 24, 2015, 140 million people in Pakistan were plunged into darkness due to damage on a key power line. The VIIRS instrument on-board Suomi NPP caught the outage while it was occurring over 80 percent of the country.



### Typhoons Lam and Marcia Head Onshore in Australia (below)

Typhoon Lam in the Arafura Sea and Typhoon Marcia off the east coast of Queensland were both expected to make landfall around 1800Z on February 19, 2015. Both storms were over waters conducive for steady strengthening up until landfall. This image is a combination of two passes from the Suomi NPP satellite's VIIRS instrument taken around 0345Z to the east and 0530Z to the west on February 19, 2015.



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